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TO 12S3-45AYR67-8

TECHNICAL MANUAL

MAINTENANCE INSTRUCTIONS

DEPOT LEVEL

SAMPLE MIL-STD-38784 MANUAL

PASSIVE DEFLECTION RECEIVING SYSTEM AN/AYR-234

AC/DC CONVERTER, CV-4567/A

WRIGHT BROS. BICYCLE SHOP AND SPACE GROUP

F19734-92-C-0072

This manual supersedes TO 12S3-45AYR67-7 dated 1 August 1996

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Technical Publications Deficiency Report

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Technical Publications Deficiency Report—Continued

Identification/ QA Sequence Number	Location
NAS WHIDBEY ISLAND No. 0047/33456	WP013 00, pg. 6
VF-65 No. 0032/35098	WP009 00, pg.3

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PREFACE

1. PURPOSE OF MANUAL.

This manual along with TO 8C12-3-4-56 provides the overhaul instructions necessary to inspect and repair the AC/DC Converter, CV-4589/A. The AC/DC converter is part of the Electronic Support Measures System (ESMS).

2. SCOPE OF MANUAL.

This manual includes AC/DC converter description, disassembly, cleaning, inspection, repair and replacement, assembly, schematic diagram, and procedures for Environmental Stress Screening (ESS).

3. NONSTANDARD ABBREVIATIONS.

Abbreviations used in this manual conform to AMSE-Y14.38M, except for the following nonstandard abbreviations.

TERM	DEFINITION
ESMS	Electronics Support Measures System
ESS	Environmental Stress Screening
HMIS	Hazardous Materials Information System
MSDS	Material Safety Data Sheet
OSHA	Occupational Safety and Health Act
SRU	Shop Replaceable Unit

4. LIST OF APPLICABLE TECHNICAL MANUALS.

Introduction material for the list of applicable technical manuals for the purpose of testing data in preparation for release. What follows is the tabular material developed to represent the list of applicable technical manuals. The tabmat element is used and the tabular format is generic with no title.

<u>T.O.</u> <u>Number</u>	<u>Title</u>
T.O. 00-25-234	General Shop Practice Requirements for the Repair, Maintenance, and Test of Electrical Equipment

<u>T.O.</u> <u>Number</u>	<u>Title</u>
T.O. 1-1-689	Prevention and Control of Corrosion and Fungus in Communication, Electronic, Meteorological, and Avionics Equipment
T.O. 1-1-8	Application and Removal of Organic Coatings, Aerospace and Non-Aerospace Equipment
T.O. 1-1A-14	Aircraft Electric and Electronic Wiring
T.O. 31-1-141-1	Basic Electronic Technology and Testing Practices - General Testing Information and Safety Precautions

5. LIST OF RELATED PUBLICATIONS.

Introduction material for the list of related publications for the purpose of testing data in preparation for release. What follows is a content specific table for List of Related Publications.

Table 1. List of Related Publications

Number	Title
8C12-3-4-56	Electronics Support Measures System
8C12-3-4-57	Electronics Support Measures System Testing
8C12-3-4-58	Electronics Support Measures Support Systems

6. TIME COMPLIANCE TECHNICAL ORDERS.

Introduction material for time compliance technical order test for purpose of testing data and functions in preparation for release.

Table 2. List of Time Compliance Technical Orders

TCTO Number	TCTO Title	TCTO Date
12S3-4AYR5-501	MOD OF LEVEL CONTROL VALVE, PN 12345-1, -2	03 March 2001

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Table 2. List of Time Compliance Technical Orders - Continued

TCTO Number	TCTO Title	TCTO Date
12S3- 4AYR5-502	MOD OF RADIO FREQUENCY MODULATOR, PN 12345-11, 12	18 April 2000
12S3- 4AYR5-503	MOD OF SLANTED DOOR WIDGET, PN 12345-3, -6	25 July 1999

7 RECORD OF APPLICABLE DIRECTIVES.

Table 3. Record of Applicable Technical Directives

Type /No.	Date	Title and ECP No.	Date Inc.	Remarks
	10 January 2001			This is a fake ECP and just filling space in this book. Format for ECP control numbers may vary.
R/123-4	15 February 2001	Black Box Modification	15 April 2001	
U/234-5		Another Black Box Modification E1234-5	15 May 2001	ECP coverage only.

SAFETY SUMMARY

1. WARNING AND CAUTION STATEMENTS.

Warning and caution statements have been strategically placed throughout this manual prior to maintenance procedures, practices, or conditions considered essential to the protection of [OCP] personnel, equipment, or property. A warning or caution will apply each time the referenced step is repeated. Prior to [HCP] starting a task, the warnings and cautions included in procedure for task will be reviewed and understood. [HCI] The following definitions apply to warnings and cautions found throughout this manual.

WARNING

An operation or maintenance procedure, practice, condition, statement, etc., which, if not strictly observed, could result in injury to or death of personnel.

CAUTION

An operation or maintenance procedure, practice, statement, etc., which if not strictly observed, could result in damage to or destruction of equipment, or loss of mission effectiveness.

2. GENERAL PRECAUTIONS.

The following are general safety precautions that are not related to any specific procedure and therefore do not appear elsewhere in this publication. These are precautions that personnel must understand and apply during the various phases of equipment operation and maintenance. Portions of this may be repeated elsewhere in this publication for emphasis.

WARNING

- Operating and maintenance personnel must at all times observe all safety regulations. Do not replace components or make adjustments inside the equipment with high voltage present. Under certain conditions, dangerous potentials may exist when a power control is in the off position, due to charges retained by capacitors. To avoid injuries, always remove power and discharge by grounding a circuit before touching it.
- Do not wear jewelry (rings, bracelets, metal watches, neck chains) while working on exposed equipment. Be very cautious about using tools near exposed terminals. Use properly insulated tools. Make test connections to terminals with insulated probe tips.
- Do not use soldering irons to remove heat shrinkable sleeving. Toxic fumes may result. Personnel injury could result.

CAUTION

- When using a heat gun to shrink electrical insulation sleeving, use low heat setting to avoid damage to adjacent components.
- Soldering shall be performed in accordance with T.O. 00-25-234, using ESDS approved soldering equipment. Failure to comply will jeopardize integrity of the ESDS assemblies.

3. HAZARDOUS MATERIALS.

This publication describes physical and chemical processes which may require the use of chemicals, solvents, paints, or other commercially available materials. The user of this publication should obtain the Material Safety Data Sheets (MSDSs) [Occupational Safety and Health Act (OSHA) Form 20 or equivalent] from the manufacturers or suppliers of materials to be used. The user must become completely familiar with the manufacturer/supplier information and adhere to the procedures, recommendations, warnings, and cautions of the manufacturer/supplier for the safe use, handling, storage, and disposal of these materials.

- Refer to the consumable materials list in chapter 1 for materials used during maintenance of this equipment. Warnings are provided in this manual to alert operating and maintenance personnel of potential hazards that

could result in personal injury; they do not replace the manufacturer's recommendations.

4. HAZARDOUS MATERIALS WARNINGS.

Warnings for hazardous materials in this manual are designed to warn personnel of hazards associated with such items when they come in contact with them during actual use. Additional information related to hazardous materials is provided in AFOSHSTD 127-66, Air Force Occupational Safety and Health Manual and the DoD 6050.5, Hazardous Materials Information System (HMIS) series publications. For each hazardous material used, a MSDS is required to be provided and available for review by users. Consult your local safety

and health staff concerning any questions on hazardous chemicals, MSDSs, personal protective equipment requirements, and appropriate handling and emergency procedures. Refer to the materials list in Chapter 1 for material used during maintenance of this equipment. The following table provides an explanation of the warning symbols for hazardous materials used in this manual. To help the reader understand the potential hazards of the hazardous materials used in this manual, a detailed hazardous materials warnings list is provided. This list has an explanation of the hazards associated with each material used in the manual. The number in the index column of the list is the same number for the warning used in the procedures of this manual.

Table 4. Table to display appropriate Footnotes

Row 1	The symbol of drops of a liquid onto a hand shows that the material will cause burns or irritation of human skin or tissue.*
Row 2	The symbol of a person wearing goggles shows that the material will injure your eyes.#,**,1
Row 3	The symbol of a flame shows that a material can ignite and burn you.
Row 4	The symbol of a flame shows that a material can ignite and burn you.
Row 5	The symbol of a human figure in a cloud shows that vapors of a material present a danger to your life or health. ²

* Checking for proper symbol and placement of first symbolized table footnote

Checking for proper placement of second table first footnote and checking to ensure that the table footnote displays properly when This is the second symbolized foot note and note that the table footnote wraps to the second line with extra text

** Third symbolized footnote and placement on the second item in the table with multiple foot notes

¹ This is the first numbered footnote and the fourth footnote in the table and the third one on this item.

² This is the second numbered footnote and the fifth in the table.

5. HAZARDOUS MATERIALS WARNINGS.

Introduction to hazardous materials paragraph and what follows is the warning tag with icons and seqnos. Please note the tagging way icons are tagged and the use of the sequence number. Also note that if you are using MIL-PRF-83495 Appendix C, Job Guides (JG), the traditional Safety Summary is not used. Tag the JG safety summary using para0s as the last paragraph of the front matter.



Iopropyl Alcohol

1

Isopropyl alcohol is flammable and toxic to eyes, skin, and respiratory tract. Skin/eye protection required. Avoid repeated/prolonged contact. Use only in well ventilated areas. Keep away from open flames or other sources of ignition.



TWO PART EPOXY ADHESIVE

Two part epoxy adhesive is toxic to eyes and skin. Skin/eye protection required. Use in a well ventilated area.



2 CHEMICAL CONVERSION MATERIAL

4

Chemical conversion material, MIL-C-81706, contains acid and is toxic to eyes, skin, and respiratory tract. Eye protection is required. Use protective gloves, clothing, and approved respirator. Provide exhaust air ventilation.



SOLDER

3

Fumes generated by soldering are toxic to respiratory tract. Eye protection is required as solder may splatter. Use only in a well ventilated area.

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CHAPTER 1

GENERAL INFORMATION

1.1 HOW TO USE THE FAULT ISOLATION MANUAL (THIS IS A PRIMARY SIDEHEAD [PARA0]).

As a general rule of thumb, do not use periods at the end of titles. The TMSS FOSI places periods at the end of titles. If you are developing a style sheet for use with other SGML aware publishing tools, you should take this requirement into account and design your stylesheet accordingly.

1.1.1 Fault Codes(This is a first subordinate sidehead [subpara1 title]). This is a first subordinate paragraph [para]. First subordinate paragraphs must have have a title. The text runs in with the title and carry over lines return to the left margin. See MIL-STD-38784 figure 7 for more information. Some **sample technical content** follows: The FI manual is used by maintenance personnel to identify and correct malfunctions encountered by the flight crew or ground crews. There are four ways to determine a fault for use with this manual: (1) The System/Subsystem/Subject Number (SSSN) Fault Isolation manual which will contain a Fault Identification and Description page for maintenance to assign a code for a given system fault. The Fault Identification and Description pages ask a series of questions that will lead maintenance personnel to a coded fault; (2) The SSSN with the Logbook Report contains a description of each of the coded faults that are covered within the FI manual; (3) The air crew uses the Fault Reporting manual, similar to the Logbook Report located within the FI manual; (4) A Job Guide (JG) referenced fault code. Once maintenance personnel have identified the coded fault they will proceed to the appropriate code within the System/Subsystem FI manual for fault/malfunction repair.

1.1.1.1 This is a Second Subordinate Sidehead [subpara2]. This is a second subordinate paragraph [subpara2]. Second subordinate paragraphs should, but don't necessarily have to have titles. The text runs in with the title and carry over lines return to the left margin. See MIL-STD-38784 figure 7 for more information.

1.1.1.1.1 This is a Third Subordinate Paragraph. If a title is required it must be included in the text of the paragraph and will not be picked up in the TOC. The text runs in with the title, if used, and carry over lines return to the left margin. Third subordinate paragraphs are usually followed by a another third subordinate paragraph or first level procedural step [step1].

1.1.1.1.2 Now for some realistic data:

1.1.2 Fault Procedures. Fault isolation procedures are provided for each specific malfunction. The procedures are made up of a series of actions which end with a corrective action. In order to be brief and concise, fault isolation procedures do not include detailed instructions necessary to gain access to components, to disconnect or connect electrical connectors, or to close panels/covers following troubleshooting. Always backtrack through the fault isolation diagram and remove any jumpers, reconnect plugs and hydraulic lines, and reinstall relays, access panels, and other removed components.

1.1.3 Corrective Action. The corrective action block makes references to Repair wiring and Isolate wiring.

- a. This is a first level procedural step [step1]. Steps don't have titles. See MIL-STD-38784, figure 7 for details. This procedural step should have an alpha character enumerator, e.g., "a." When the corrective action block references to Repair wiring with a Wiring Diagram (WD), the troubleshooting procedure has isolated the malfunction down to a faulty wire segment and the wiring will be repaired in accordance with the WD. The WD reference provided is to the 03 diagram which is the first block interconnect diagram of the system, it will be necessary for maintenance personnel to locate the appropriate wiring within the referenced section.
- (1) This is a second level procedural step [step2]. It should be enumerated with an numeric character and be blocked text indented 2 em spaces from the enumerator.
- (2) This is another second level procedural step [step2]
- (3) This is another second level procedural step [step2]
- (4) This is another second level procedural step [step2]
 - (a) This is a third level procedural step [step3].
 - (b) This is a third level procedural step [step3].
- b. When the corrective action block references to Isolate wiring with a Schematic Diagram (SD), maintenance personnel will be required to further isolate the faulty wire down to a faulty segment with the referenced SD. Then the WD will be used to repair the wiring segment. In the event the corrective action does not fix a

problem, and there are no further corrective actions provided, the technician will refer to the appropriate SD for further troubleshooting. When a fault exists that is not identified by the FI/FR manual, the technician will refer to the appropriate SD's for further troubleshooting.

1.1.4 Manual Layout. The following is a list of how the manual is broken down and what is contained in each of the sections within the FI manual:

- a. The Front Matter contains an Alphabetical Index which provides a listing of all LRU's and their respective SSSN in the manual.
- b. The pictorial and alphabetical Table of Contents for each chapter identifies the system/subsystem number. It also contains pertinent panel indications that the operator may use to aid in Fault Isolation.
- c. The Fault Identification and Description page provides logical fault flow charting. It contains fault reporting information, circuit breaker information, fault location, effectivity information, and subsystem identification. Maintenance personnel will establish a coded fault from the symptoms and conditions involved in a fault. Once the coded fault has been established, either through the Fault Isolation manual or the Fault Reporting manual, maintenance personnel will need to locate the coded fault within the Fault Isolation section of the FI manual and follow the procedures for fault correction. Coded fault numbers will appear at the lower outer edge above the page number.

NOTE

When the Fault Identification and Description page makes a reference to a coded fault that begins with [ldquo]FI[rdquo] it is referencing out to another system manual. It will be necessary for maintenance personnel to go to the referenced Fault Isolation manual to further identify the fault within the appropriate system. Also, when the reference contains [ldquo]XX[rdquo] it represents a place holder for a code that has yet to be determined within that manual.

- d. The Log Book Report contains a complete word description of all coded faults found within the Fault Isolation manual. Maintenance personnel may fully identify and locate all fault isolation procedures for faults/malfunctions that are covered within this manual. The coded fault will provide corrective procedures to be performed by maintenance personnel.
- e. Location of Parts provides an illustrated means for location, identification, and access data for components referenced within the manual.

- f. Fault Isolation pages provide coded fault procedures for maintenance actions. These codes come from either the Fault Reporting manual, Job Guides (JG), or from two areas within the Fault Isolation manual; The Fault Identification and Description page or the Log Book Report. The Fault Isolation procedures will lead maintenance personnel to a corrective action for a given fault/malfunction.

- g. Supplemental Data is in the form of tables, written text, and/or supporting illustrations to provide support to Fault Isolation procedures. The Supplemental Data section will be referenced to within the procedures.

1.1.5 Memory Monitor. The purpose of the Memory Data Extraction Tool (MDET) is to produce fault isolation data as an aid in troubleshooting by aircraft maintenance personnel.

1.1.5.1 The Memory Data Extraction Tool data tables are used directly with the Fault Isolation manuals. There are two distinct methods to access the Memory Data Extraction Tool data tables (Index and Variable). For additional information pertaining to the use of the Memory Data Extraction tool, refer to 1C-123A-2-40GS-00-1.

1.1.5.2 When directed by the Fault Isolation manual to use Memory Monitor (MEM MON), it will be necessary to use 1C-123A-2-40GS-00-1 to obtain the proper address code to be entered for the troubleshooting procedure. To search the source LRU, the Fault Isolation Table-Index Section should be used. The source line replaceable units are sorted alphanumerically. Once the desired source line replaceable unit is found within this, the message name must also be found which is also sorted alphanumerically. Once the message name is obtained, the menu to be utilized and start address is obtained by reading over to the right from the message name. The starting address is then added to the supplied offset, in hexadecimal, from the Fault Isolation manual. The offset is used so that the data is displayed on the *DGU MEM* or *MC MEM* menu in the top/left data field.

1.1.5.3 The offset is obtained from the respective Fault Isolation manual and added to the message name start address. An example of this is adding 52B (offset) to 8048BBE0 (start address), which results in 812348C10B. This hexadecimal address value is then entered in the Display Generator Unit ADDR data field on the *DGU MEM* menu. The format utilized on the *DGU MEM* menu is obtained from the Fault Isolation manual. Once the format is known (in this case as BINARY) it is entered in the FORMAT data field on the *DGU MEM* menu. The entered start address (82348C10B) will then be displayed in the ADDR data field and the corresponding data is displayed in the top line of the BINARY data field. The displayed data is then checked

against the expected results in the Fault Isolation manual to determine the next course of action.

1.1.5.4 The other method to access the Memory Data Extraction Tool data is when the Fault Isolation manual directs the operator to a functional group. When this happens the operator uses the Variable Section tables to determine the starting memory address. The Variable tables are subdivided into four different tables Acquisition, Control and Display, Process and Integration, and Fire Control. Once the desired table is found as indicated by the Fault Isolation manual, the variable name (sorted alphanumerically) is located to obtain the starting memory address. Once this is accomplished everything is the same as previously discussed.

1.2 DESCRIPTION.

1.2.1 AC/DC Converter Description. The AC/DC converter is a part of the Electronic Support Measures System installed on the E-1A Aircraft. The AC/DC converter has a 115 vac input and provides an output of 28 vdc required by the ESMS. The AC/DC converter is shown in Figure 1-1.

1.2.2 AC/DC Converter Physical Description. The AC/DC converter consists of capacitors, a transformer, coils, diodes, an over temperature switch, a temperature sensor, and an elapsed time meter. These components are mounted in a metal case. Table 1-1 lists the AC/DC converter shop replaceable units (SRUs).

1.2.3 AC/DC Converter Functional Description. The AC/DC converter consists of a three phase transformer and rectifier circuit to convert the 115 volt 3-phase 400 Hz input power to the nominal 28 volt dc power required by the ESM system. The basic design of this unit uses a three-phase, 4-wire wye input. The dc output is produced by rectifying two secondaries in parallel. One secondary is wye-connected and the other is delta-connected. This connection results in the ac peaks of the two secondary windings being out-of phase which effectively doubles the output ripple frequency to 2400 Hz.

1.2.3.1 A temperature sensor is connected to the input power connector through an isolated shielded wire pair. The sensor is a solid state temperature sensor with nominal linear output of 1A/K. Output is 298A at 25C. A normally closed bi-metallic switch is provided to indicate AC/DC converter overtemperature, however this function is not used on E-1A aircraft.

1.2.3.2 An elapsed time meter is mounted integral to the converter and connected to the dc output. The front cover of the converter must be removed to read the meter.

1.2.3.2.1 Subpara3 title. Subpara 3 para. An elapsed time meter is mounted integral to the converter and connected

to the dc output. The front cover of the converter must be removed to read the meter.

1.2.3.2.1.1 Subpara4 Title. Subpara4 para. An elapsed time meter is mounted integral to the converter and connected to the dc output. The front cover of the converter must be removed to read the meter.

1.2.3.2.1.2 Subpara4 Title. Subpara4 para. An elapsed time meter is mounted integral to the converter and connected to the dc output. The front cover of the converter must be removed to read the meter.

1.2.3.2.1.2.1 Subpara5 Title. Subpara 5 para. The front cover of the converter must be removed to read the meter. The front cover of the converter must be removed to read the meter. The front cover of the converter must be removed to read the meter.

1.2.3.2.1.2.2 Next Subpara5 Title. Next subpara 5 para. The front cover of the converter must be removed to read the meter. The front cover of the converter must be removed to read the meter. The front cover of the converter must be removed to read the meter.

1.2.3.2.1.2.2.1 Subpara6 Title. Subpara 6 para. The front cover of the converter must be removed to read the meter. The front cover of the converter must be removed to read the meter. The front cover of the converter must be removed to read the meter.

1.2.3.2.1.2.2.1.1 Subpara7 Title. Subpara7 para. The front cover of the converter must be removed to read the meter. The front cover of the converter must be removed to read the meter. The front cover of the converter must be removed to read the meter.

1.2.3.2.1.2.2.1.1.1 Subpara8 Title. Subpara8 para. The front cover of the converter must be removed to read the meter. The front cover of the converter must be removed to read the meter. The front cover of the converter must be removed to read the meter.

1.2.3.2.2 Subpara3 Title. Subpara3 para. An elapsed time meter is mounted integral to the converter and connected to the dc output. The front cover of the converter must be removed to read the meter.

1.2.3.2.2.1 Suppara4 Title. Subpara4 para. An elapsed time meter is mounted integral to the converter and connected to the dc output. The front cover of the converter must be removed to read the meter.

1.2.3.2.2.2 Suppara4 Title. Subpara4 para. An elapsed time meter is mounted integral to the converter and connected to the dc output. The front cover of the converter must be removed to read the meter.

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1.3 LEADING PARTICULARS.

Table 1-2 lists the principal physical and electrical characteristics of the AC/DC converter.

1.4 CONSUMABLE MATERIALS.

Figure 1-1 lists the consumable materials required during cleaning, repair, and assembly of the AC/DC converter.

Table 1-1. AC/DC Converter Shop Replaceable Units (table title)

Nomenclature	Reference Designator	Part Number
Meter Subassembly ¹	M1	4000-11024-03
Relay	K2	1234-123456-01
¹ this is a footnote test to show how span works in 38784		

1.5 TABLE OF LEADING PARTICULARS.

The following table describes the specifications applicable to the supported equipment for which this TO was written. Any

deviation must be approved by the Using Command. This data is entered between Table 1-1 and Table 1-2.

Table 1-2. Leading Particulars for the AC/DC Converter

Nomenclature	Remarks
Size	This is a deflist term: Deflist definition in a table Length: 11.3 in. Width: 6.1 in. Height: 6.3 in.
Weight	17.5 lb. (max)
Load Current	Max: 200 a Min: 2 a
Power	Input: 112.5 to 117.5 vrms, 3 phase, 380 to 420 MHz Output: with 112.5 vrms input: 27.6 vdc at 2 a 24.7 vdc at 200 a Output: with 117.5 vrms input: 28.7 vdc at 2 a 26.0 vdc at 200 a

1.6 THE AC/DC CONVERTER CONSUMABLES WITH HCI SYMBOL.

The table has all the information you to replace consumable parts when performing maintenance on the AC/DC Converter.

Order only what you need and use what you order. Otherwise this paragraph provides filler between Table 1-2 and Figure 1-1 1-1.

Nomenclature	Specification/Part No.	CAGE Code ¹
Adhesive, Epoxy, Two Part, Resin-Filled, General Purpose	4000-41212-01	32562
Alcohol, Isopropyl	TT-I-735	81348
Chemical Conversion Material	MIL-C-81706, Class 3	81348
Cloth, Cleaning, Nonwoven Fabric	CCC-C-46, Type I, Class 1	81348
Detergent, General Purpose, Liquid	MIL-D-16791, Type I	80244
Ink, Marking, Epoxy Base ²	MIL-I-43553, Type I, Black	81349

Nomenclature	Specification/Part No.	CAGE Code ¹
Insulation Sleeving, Electrical	<ul style="list-style-type: none"> This is a random list inserted into into a table cell. Text is justified. MIL-I-23053/5, Class 1, Size 02, Color 4 MIL-I-23053/5, Class 1, Size 04, Color 0 	81349
Solder, Tin Alloy	QQ-S-571: SN63PB37WRMAP3	81348
Tape, Lacing and Tying	MIL-T-43435, Type I, Finish B, Size 4	81349
Wire, Electrical	<ul style="list-style-type: none"> This text is right justified. or it is supposed to be MIL-W-22759/16, Size 22, Color 90 MIL-W-22759/16, Size 22, Color 92 	81349
¹ This is a footnote in figtable. Figtables are only used in flight manuals. Maintenance manuals always display a graphic in a figure. If a table is needed in a maintenance manual along with a figure, use a legend with the graphic or make the table (legend) part of the actual graphic.		
² This adds to the example for multiple footnotes in figtable		

Figure 1-1. Consumables.

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CHAPTER 2

SPECIAL TOOLS AND TEST EQUIPMENT

2.1 GENERAL.

This chapter lists all special tools and test equipment required for maintaining the AC/DC converter.

2.2 SPECIAL TOOLS AND TEST EQUIPMENT.

None

2.3 LOCAL MANUFACTURE ITEMS.

None

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CHAPTER 3

DISASSEMBLY

3.1 GENERAL.

WARNING

Do not use soldering iron to remove heat shrinkable sleeving. Toxic fumes may result. Personnel injury could result.

This chapter provides disassembly procedures for the AC/DC converter. Disassembly procedures vary with the type of work to be performed and should only be done to the extent necessary. The figure supporting the disassembly have callout numbers that are defined in the legend on the figure. During disassembly all mounting hardware should be retained. Soldering/desoldering shall be performed in accordance with T.O. 00-25-234.

3.2 REMOVAL FROM THE SHIPPPING CONTAINER.

Upon receipt, the power supply may be in a shipping container. Remove from the shipping container per T.O. 00-25-234.

3.3 METER SUBASSEMBLY REMOVAL.

WARNING

- Ensure power to AC/DC converter is removed before performing maintenance; otherwise, injury to personnel or damage to equipment could occur.
 - A recently powered AC/DC converter may be extremely hot. Allow unit to cool or use extreme caution when working around unit to minimize a potential burn hazard.
- a. Remove three self-locking nuts (11, Figure 3-1) and remove front cover (10) from converter.

- b. Cut tape securing wires from meter (6) to wires from capacitor C8 (2).
- c. Remove two nuts (5) and flat washers (4) and remove meter wires from positive and negative posts (3) of converter. If necessary remove capacitor wires first.
- d. Remove two nuts (13), two lock washers (14), and four flat washers (15), and remove bracket (12) from mounting studs on converter.
- e. Remove two screws (9), flat washers (7), and lock washers (8), and remove meter from bracket (12).

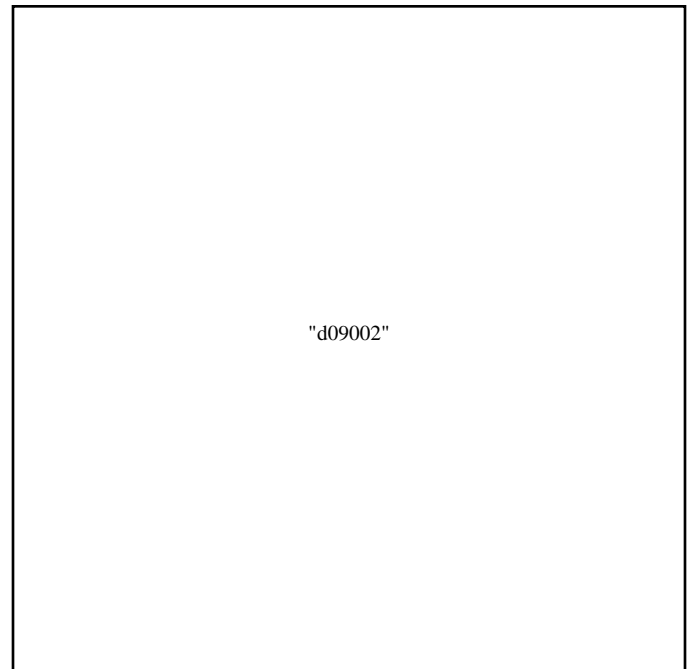


Figure 3-1. METER M1 REMOVAL/INSTALLATION.

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CHAPTER 4

CLEANING

4.1 GENERAL.

This chapter provides cleaning instruction for the AC/DC converter. Ensure that needed cleaning, as determined by a visual inspection, is performed prior to assembly and application of power for testing.

4.2 CLEANING PROCEDURES.

Cleaning materials for the power supply are listed in Consumable Materials list.



LIQUID DETERGENT

3

- a. Clean the exterior as required, using lint-free cloth, mild detergent and water solution. Clean interior components as prescribed in T.O. 00-25-234.



ISOPROPYL ALCOHOL

1

- b. After soldering, clean all joints with isopropyl alcohol, TT-I-735, to remove all traces of resin and other foreign matter.

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CHAPTER 5

INSPECITON, REPAIR AND REPLACEMENT

5.1 GENERAL.

This chapter provides inspection, repair, and replacement procedures for the AC/DC converter.

5.2 INSPECTION.

5.2.1 General. Inspection should be performed in conjunction with overhaul activities, or when a component is removed or replaced. Discrepancies encountered during an inspection shall be repaired and/or cleaned in accordance with applicable procedures in this manual.

5.2.2 Overall Visual Inspection. Visually inspect the power supply for the following:

- a. Inspect for contamination by dust, dirt, or other foreign matter.
- b. Inspect for fungus growth and corrosion on metal surfaces including connector pins.
- c. Inspect identification plate, information plate, and caution marker for damage.
- d. Inspect converter case for scratches, dents, distortion, or other obvious signs of wear or damage.
- e. Inspect connector for contacts that are missing, bent, broken or out of alignment or for damaged insulation.
- f. Inspect for Evidence of Overheating or Other Damage

5.3 REPAIR AND REPLACEMENT.

5.3.1 GENERAL. Repair consists of wiring repair, corrosion removal and replacement of damaged or faulty components. Refer to T.O. 12S2-2AYR2-134 for Illustrated Parts Breakdown (IPB).



TWO PART EPOXY ADHESIVE

2

- a. Information plate is secured to converter case using two-part epoxy adhesive.
- b. Repair minor dents in accordance with T.O. 00-25-234.
- c. Repair cover finish using chemical conversion coating MIL-F-14072, E512 in accordance with T.O. 1-1-8.

Repair of converter finish shall conform to FED-STD-595, color 37038 (black).



SOLDER

4

- d. Soldering shall be in accordance with T.O. 00-25-234.



ISOPROPYL ALCOHOL

1

- e. Clean solder joints with isopropyl alcohol, TT-I-735, to remove all traces of resin and other foreign matter.

5.3.2 Electrical Component Replacement. Electrical component replacement shall be in accordance with T.O. 00-25-234.

5.3.3 Connector Repair. Repair or replace connector as required in accordance with T.O. 00-25-234.

5.3.4 Wire Repair. Repair meter wiring in accordance with T.O. 00-25-234 and T.O. 1-1A-14.

WARNING

Do not use soldering iron to remove heat shrinkable sleeving. Toxic fumes may result. Personnel injury could result.

CAUTION

When using heat gun to shrink electrical insulation sleeving, use a low heat setting to avoid damage to adjacent components.

- a. Replace terminal lugs and sleeving as necessary.
- b. After repair, bind wires together as necessary using lacing and tying tape.

5.3.5 Marking Repair. Replace damaged markings using MIL-I-43553-I, Black marking ink in accordance with MIL-STD-130.

5.3.6 Corrosion Prevention. Remove corrosion in accordance with T.O. 1-1-689.

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CHEMICAL CONVERSION MATERIAL

5

- a. Repair bare metal on cover using chemical conversion material MIL-C-81706, Class 3 in accordance with T.O. 1-1-8.
- b. Repair of converter finish shall conform to FED-STD-595, color 37038 (black).

CHAPTER 6

ASSEMBLY

SECTION I ASSEMBLY PART 1

6.1 GENERAL.

This chapter contains information necessary to assemble the AC/DC converter. After assembly the AC/DC converter should be checked by testing procedures in chapter CHAPTER 7. Soldering shall be performed in accordance with T.O. 00-25-234.

6.2 ASSEMBLY.

6.2.1 Meter Subassembly Installation. Introduction paragraph for this particular series of steps. This will reference the following - (Figure 3-1)

- a. Position meter (6) on bracket (12) and secure with two screws (9), flat washers (7) and lock washers (8).

- b. Place meter bracket on converter mounting studs and secure with four flat washers (15), two lock washers (14), and two nuts (13).
- c. Install meter wires onto posts (3) observing polarity of wires and posts. Ensure capacitor C8 (2) wires are installed on posts.
- d. Install two flat washers (4) and nuts (5) to posts.
- e. Using lacing and tying tape, secure meter and capacitor wires.
- f. Position converter front cover (10) and install three self-locking nuts (11) to secure cover to converter (1).

6.2.2 Functional Test. Perform AC/DC converter checkout procedures per T.O. 8C24-6-8-10.

SECTION II ASSEMBLY PART 2

6.3 ASSEMBLY.

6.3.1 Meter Subassembly Installation. Introduction paragraph for this particular series of steps. This will reference the following - (Figure 3-1)

- a. Position meter (6) on bracket (12) and secure with two screws (9), flat washers (7) and lock washers (8).
- b. Place meter bracket on converter mounting studs and secure with four flat washers (15), two lock washers (14), and two nuts (13).
- c. Install meter wires onto posts (3) observing polarity of wires and posts. Ensure capacitor C8 (2) wires are installed on posts.
- d. Install two flat washers (4) and nuts (5) to posts.
- e. Using lacing and tying tape, secure meter and capacitor wires.
- f. Position converter front cover (10) and install three self-locking nuts (11) to secure cover to converter (1).

6.3.2 Functional Test. Perform AC/DC converter checkout procedures per T.O. 8C14-6-6-33.

6.4 GENERAL.

This chapter contains information necessary to assemble the AC/DC converter. After assembly the AC/DC converter should be checked by testing procedures in CHAPTER 7. Soldering shall be performed in accordance with T.O. 00-25-234.

6.5 ASSEMBLY.

6.5.1 Meter Subassembly Installation. Introduction paragraph for this particular series of steps. This will reference the following - (Figure 3-1)

- a. Position meter (6) on bracket (12) and secure with two screws (9), flat washers (7) and lock washers (8).
- b. Place meter bracket on converter mounting studs and secure with four flat washers (15), two lock washers (14), and two nuts (13).

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- c. Install meter wires onto posts (3) observing polarity of wires and posts. Ensure capacitor C8 (2) wires are installed on posts.
- d. Install two flat washers (4) and nuts (5) to posts.
- e. Using lacing and tying tape, secure meter and capacitor wires.
- f. Position converter front cover (10) and install three self-locking nuts (11) to secure cover to converter (1).

6.5.2 Functional Test. Perform AC/DC converter checkout procedures per T.O. 8C14-6-6-33.

CHAPTER 7

TESTING

7.1 GENERAL.

7.1.1 Testing. All checkout and troubleshooting procedures for the power supply are contained in T.O. 8C14-6-6-33.

7.1.2 Circuit Diagrams. The schematic diagram of the AC/DC converter is provided in Figure 7-1.

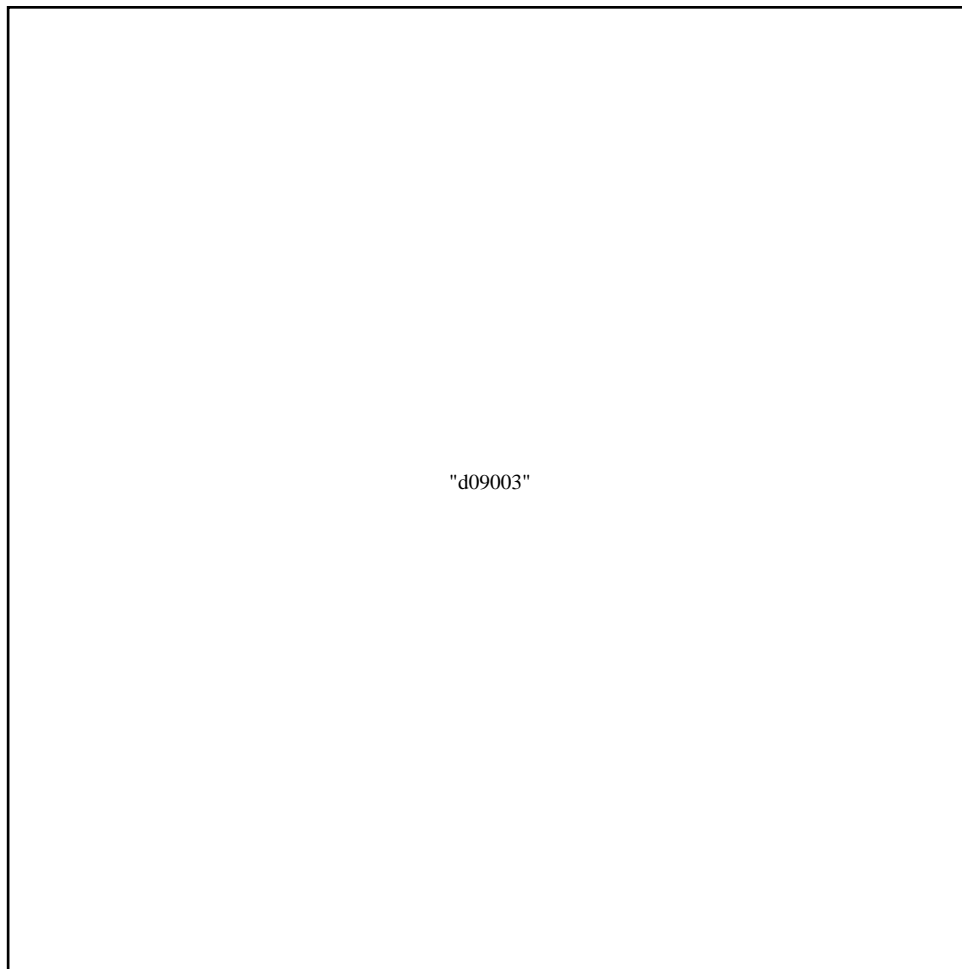


Figure 7-1. AC/DC Converter Schematic Diagram.

7.2 GENERAL.

7.2.1 Testing. All checkout and troubleshooting procedures for the power supply are contained in T.O. 8C14-6-6-33.

7.2.2 Circuit Diagrams. The schematic diagram of the AC/DC converter is provided in Figure 7-1.

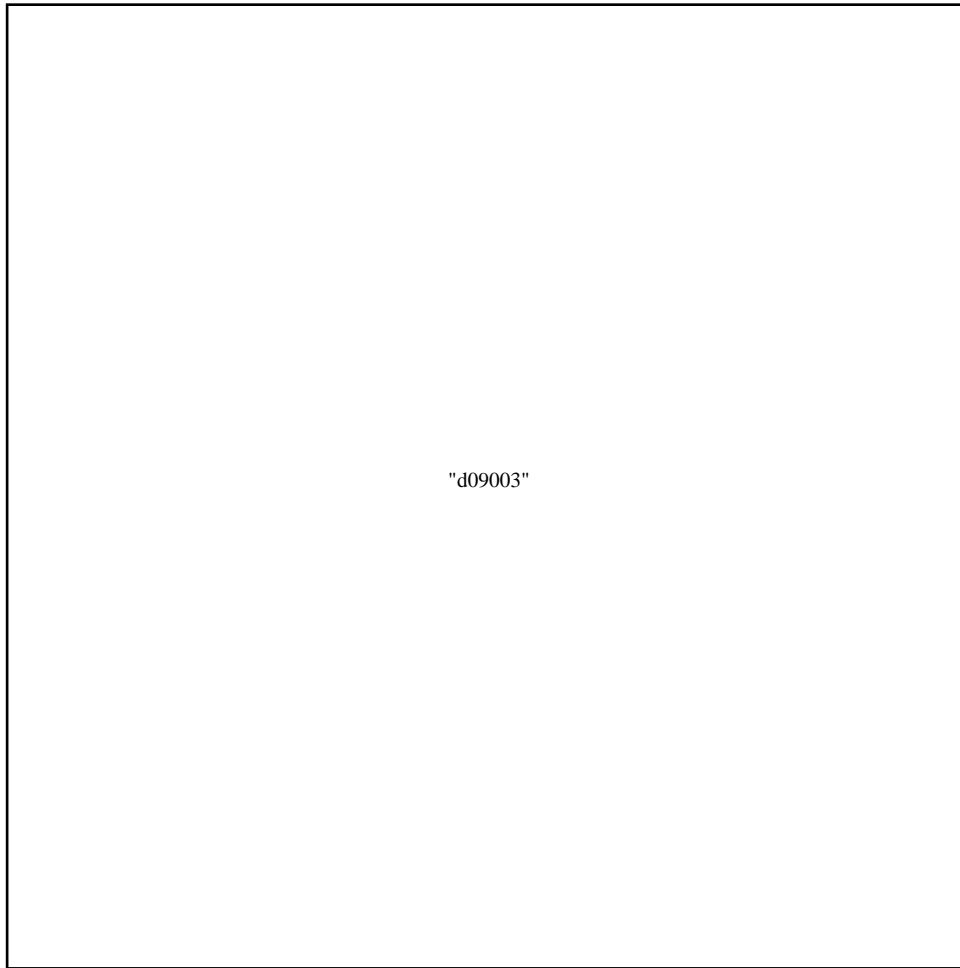
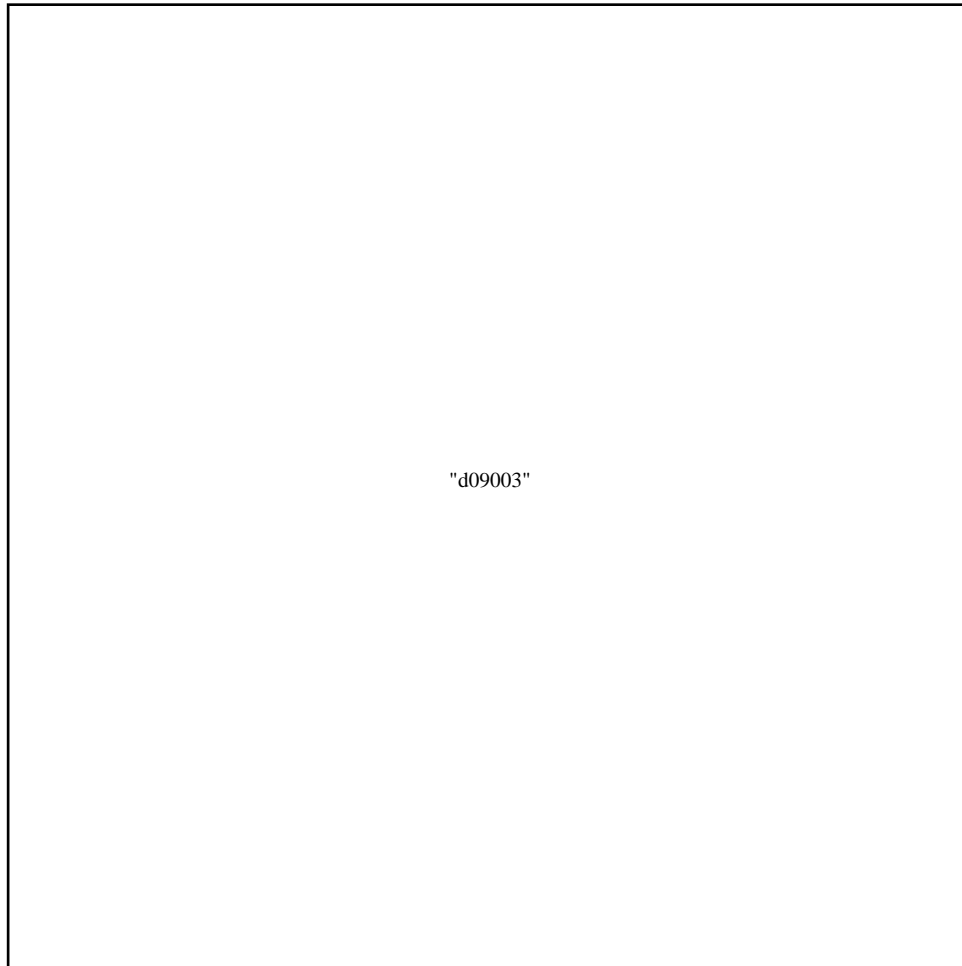


Figure 7-2. AC/DC Converter Schematic Diagram.

7.3 GENERAL.

7.3.1 Testing. All checkout and troubleshooting procedures for the power supply are contained in T.O. 8C14-6-6-33.

7.3.2 Circuit Diagrams. The schematic diagram of the AC/DC converter is provided in Figure 7-1.



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Figure 7-3. AC/DC Converter Schematic Diagram.

Chapter 8

ILLUSTRATED PARTS BREAKDOWN

SECTION I FOREWORD

8.1 INTRODUCTION.

This Illustrated Parts Breakdown (IPB) describes the parts that make up the Control and Computation Subsystem (CCS). CCS assemblies and equipment that were designed specifically for this contract are broken down in detail in this chapter. Commercial Off The Shelf (COTS) equipment which is used in the CCS is shown at the assembly level in this chapter. Refer to the respective vendor manual for the details on the COTS equipment. Figure 8-1 shows how to use the IPB if a part number or reference designator is known.

8.2 PARTS LIST.

The parts list are divided into figures by main equipment groups and/or assemblies. Each group or assembly is keyed to a related illustration by figure and index number. They are then broken down into assemblies, modules and detailed parts. The relation of each part to its next higher assembly and/or group is shown either by indentation or by figure cross-reference notes. The parts list is divided into seven columns as described below:

- a. Figure and Index Number. The figure and index number is used to correlate the parts list with the applicable illustrated item. Each sheet of multi-sheet illustrations is numbered separately beginning with the number 1.
- b. Part Number. The part number can be one of several types; specification control number, vendor part number, and commercial part number.
- c. Commercial and Government Entity (CAGE) Code . The CAGE code for each part number is listed in this column. These codes are in accordance with the CAGE cataloging handbook H4/H8 and amendments thereto.
- d. Description. The description column contains indentation, nomenclature and cross-reference information.
- e. Units Per Assembly. This column indicates the number of units for one next higher assembly. REF designates those items which are listed for reference purposes only.
- f. Useable On Code. This column is used to indicate the parts usage. The absence of a code indicates that the part is useable on all of its next higher assemblies.

- g. Source, Maintenance and Recoverability (SMR) Code. This column contains Joint Military Services Uniform SMR codes as defined in TO 00-25-195

8.2.1 Subpara for Illustrated Parts Breakdown. This paragraph is a test for the placement of security markings and for the test of primary subpara in a content specific IPB paragraph.

8.2.2 Subpara for Illustrated Parts Breakdown. This paragraph is a test for the placement of security markings and for the test of primary subpara in a content specific IPB paragraph.

8.3 NUMERICAL INDEX.

The Numerical Index follows the parts lists and contains an alphanumerical listing of all drawings and parts that are listed in the parts list of this IPB.

8.4 REFERENCE DESIGNATION INDEX.

The Reference Designation Index follows the Numerical Index and contains a listing of the reference designations that are assigned to the parts list of this IPB. Reference designations appear on electrical and electronic diagrams and assist in correlating graphic symbols shown thereon with parts lists, descriptions, and instructions concerning the diagrams. Not all parts in the parts list have an associated reference designation.

8.5 MODELS COVERED.

This IPB covers the AN/GSQ-T97 CCS for the GRMDS.

8.6 USABLE ON CODES.

As described above, this column is used to indicate the parts usage. The absence of a code indicates that the part is useable on all of its next higher assemblies.

8.7 SOURCE, MAINTENANCE, AND RECOVERABILITY (SMR) CODES COLUMN.

As described above, this column contains Joint Military Services Uniform SMR codes as defined in TO 00-25-195.

8.8 PARTS STANDARDIZATION.

Authority for use of a part number different than the part number listed in this IPB is established by the Department of Defense (DoD) Interchangeability and Substitution (I & S)

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program. Refer to the DO43B Master Item Identification Base for Air Force I & S information. The maintenance technician

has final responsibility and authority for determining acceptability of substitute parts.

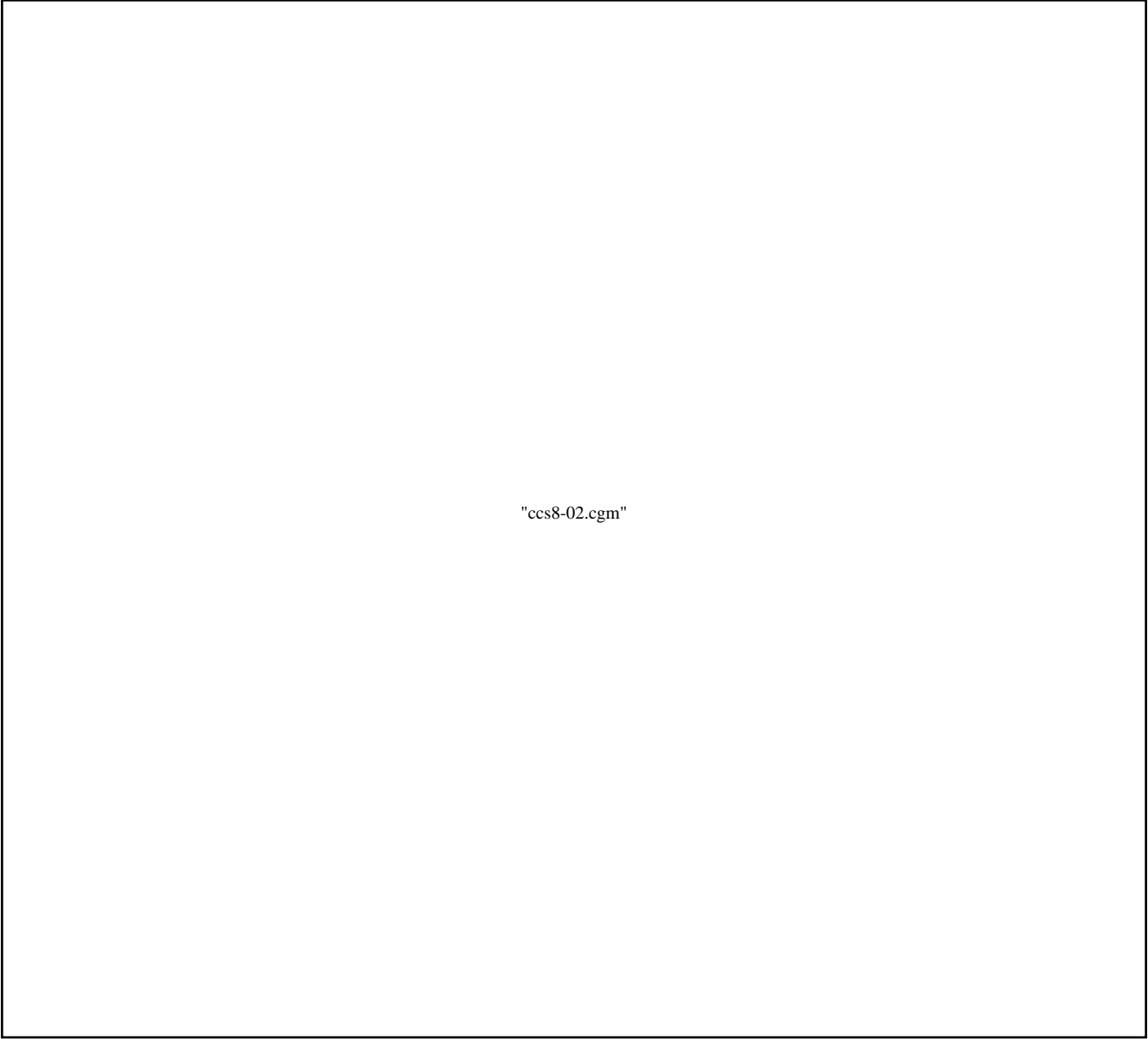
"ccs8-01a.cgm"

Figure 8-1. How to Locate Parts. (Sheet 1 of 2)

"ccs8-01b.cgm"

Figure 8-1. How to Locate Parts. (Sheet 2)

SECTION II MAINTENANCE PARTS LIST



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Figure 8-2. Control and Computation Subsystem Group, Building 470.

FIGURE & INDEX/ SHEET NO.	PART NUMBER	CAGE	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE	SMR CODE
8 2	9522229-101	98747	CONTROL AND COMPUTATION SUB-SYSTEM GROUP, MAIN SITE - BUILDING 470	REF		XB
1	9522233-101	* 98747	. CCS CONSOLE ASSY	1		XB
			(See Figure 8-3 for Details)			
2	9522234-101	98747	. SOC CONSOLE ASSY	1		XB
			(See Figure 8-6 for Details)			

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FIGURE & INDEX/ SHEET NO.	PART NUMBER	CAGE	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE	SMR CODE
3	SW250A	59951	. SWITCH, 2 Position (VID 9522332-001)	1		PAODDT
4	LQ-2550	61722	. PRINTER, Automatic Data (VID 9522335-001)	1		XB
5	GPSTATION	38757	. RECEIVER - GPS (VID 9522191-001)	1		PAODDT
6	MODEL 501	38757	. ANTENNA - GPS (VID 9522227-001)	1		PAODDT
7	9522290-101	98747	. CABLE ASSEMBLY - (W13)	1		AFF
	GPS-C030	38757	. . CABLE ASSY, Radio Frequency (VID 9522230-001)	1		PAOZZN
	TTW2.5F	67041	. . MARKER (VID 9522452-001)	2		PAOZZN
8	9522298-101	98747	. CABLE ASSEMBLY - (W2)	1		AFF
	TTW2.5F	67041	. . MARKER (VID 9522452-001)	2		PAOZZN
	BC00103	59951	. . CABLE ASSEMBLY (VID 9522452-001)	1		PAOZZN
9	9522300-101	98747	. CABLE ASSEMBLY - (W3)	1		AFF
	TTW2.5F	67041	. . MARKER (VID 9522452-001)	2		PAOZZN
	EYN600-000	59951	. . CABLE ASSEMBLY (VID 9522452-001)	1		PAOZZN
10	9522300-102	98747	. CABLE ASSEMBLY - (W4)	1		AFF
	TTW2.5F	67041	. . MARKER (VID 9522452-001)	2		PAOZZN
	EYN600-0020-MM	59951	. . CABLE ASSEMBLY (VID 9522452-001)	1		PAOZZN
11	9522296-101	98747	. CABLE ASSEMBLY - (W5)	1		AFF
12	9522296-102	98747	. CABLE ASSEMBLY - (W7)	1		AFF
13	9522296-103	98747	. CABLE ASSEMBLY - (W6)	1		AFF
14	9522296-104	98747	. CABLE ASSEMBLY - (W14)	1		AFF
	TTW2.5F	67041	. . MARKER (VID 9522452-001)	2		PAOZZN
	EDN12H	59951	. . CABLE ASSEMBLY (VID 9522316-001)	1		PAOZZN
15	9522297-101	98747	. CABLE ASSEMBLY - (W8)	1		AFF
16	9522297-102	98747	. CABLE ASSEMBLY - (W9)	1		AFF
	TTW2.5F	67041	. . MARKER (VID 9522452-001)	2		PAOZZN
	EBN25C-0025-MM	59951	. . CABLE ASSEMBLY (VID 9522452-001)	1		PAOZZN
17	9522353-102	98747	. CABLE ASSEMBLY - (W11)	1		AFF
	M39012/12-0101	81349	. . CONNECTOR (P1,P2)	2		PAOZZN
	MS3368-1-9B	96906	. . STRAP, TIEDOWN (Marker)	6		PAOZZN
18	9522350-101	98747	. CABLE ASSEMBLY - (W12)	1		AFF
	M39012/17-0101	81349	. . CONNECTOR (P1)	1		PAOZZN
	MS24308/4-7	96906	. . CONNECTOR (P2)	1		PAOZZN
	9522431-001	98747	. . BACKSHELL	1		PAOZZN
	9522431-001	98747	. . FERRULE, SPLIT-RING	1		PAOZZN
	MS3368-1-9B	96906	. . STRAP, TIEDOWN (Marker)	2		PAOZZN
19	UDC83020C25RT03	55455	. POWER SUPPLY (VID 9522452-001)	1		XB
20	UBCB0140H25YJ	55455	. RACK, BATTERY (VID 9522437-001)	1		XB

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FIGURE & INDEX/ SHEET NO.	PART NUMBER	CAGE	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE	SMR CODE
21	U125D1S25A1	55455	1 . CIRCUIT BREAKER BOX 2 (VID 9522438-001) 3 4 5 6 7	1		XB
21	U125D1S25A1	55455	1 . CIRCUIT BREAKER BOX 2 (VID 9522438-001) 3 4 5 6 7	1		XB

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Figure 8-3. CCS Console Assembly Unit 18.

FIGURE & INDEX/ SHEET NO.	PART NUMBER	CAGE	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE	SMR CODE
			1 2 3 4 5 6 7			
8 3	9522233-101	98747	WORKSTATION ASSY - CCS, UNIT 18	REF		XB
			(See Figure 8-2 for NHA)			
1	9522445-101	98747	. CONSOLE ASSY - SERVER, (A1)	1		PAODDT
	D-48604-S3	12345	. . COMPUTER, DIGITAL - SERVER	1		PAODDT
			(VID 9522327-001)			
2	9522304-101	98747	. . TIME AND FREQUENCY PROCESSOR ASSY (A2)	1		PAODDT
			(See Figure 8-4 for Details)			
3	9522279-101	98747	. . SERIAL COMMUNICATION PROCESSOR ASSY (A3)	1		PAODDT

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FIGURE & INDEX/ SHEET NO.	PART NUMBER	CAGE	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE	SMR CODE
4	P-TER2	67881	(See Figure 8-5 for Details) . TERMINAL, Data Processing (A2) (VID 9522328-001)	1		XB

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Figure 8-4. Time and Frequency Processor Assembly.

FIGURE & INDEX/ SHEET NO.	PART NUMBER	CAGE	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE	SMR CODE
8 4	9522304-101	98747	TIME AND FREQUENCY PROCESSOR ASSY	REF		PAODDT
1	A9005-950	00053	. ADAPTER, VMEBUS	1		PAODDT
			(See Figure 8-3 for NHA)			
2	BC635VME	03332	. CIRCUIT CARD ASSY - Time and Frequency Processor	1		PAODDT
			(VID 9522236-002)			
			(VID 9522237-001)			

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Figure 8-5. Serial Communication Processor Assembly.

FIGURE & INDEX/ SHEET NO.	PART NUMBER	CAGE	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE	SMR CODE
8 5	9522279-101	98747	1 2 3 4 5 6 7 SERIAL COMMUNICATION PROCESSOR ASSY	REF		PAODDT
1	A9005-V54	00223	(See Figure 8-3 for NHA) . ADAPTER, Serial Communication Processor	1		PAODDT
2	VCOM-54	26820	(VID 9522207-001) . CIRCUIT CARD ASSY, Serial Communication Processor	1		PAOLDT
			(VID 9522205-001)			

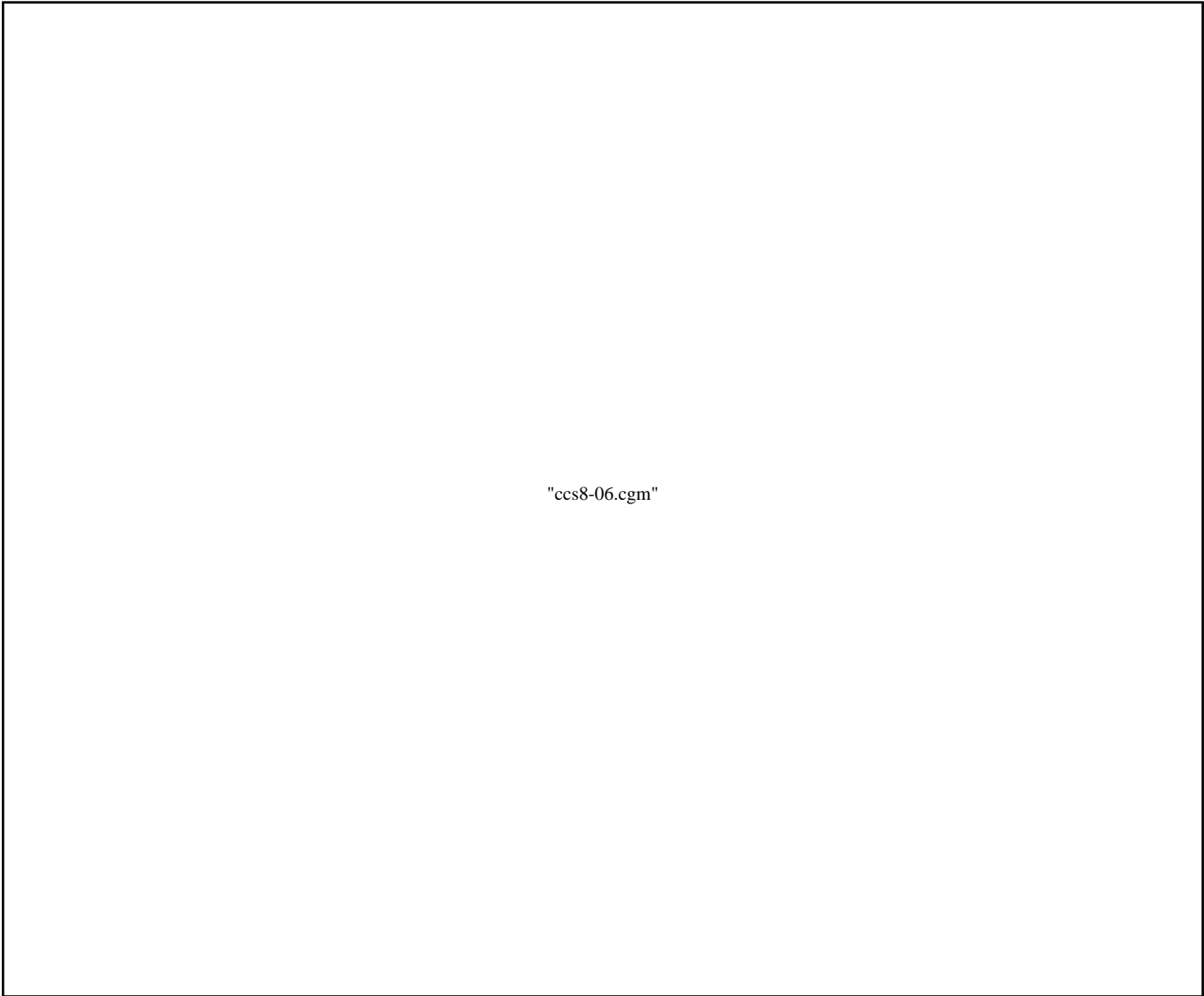


Figure 8-6. SOC Console Assembly Unit 19.

FIGURE & INDEX/ SHEET NO.	PART NUMBER	CAGE	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE	SMR CODE
8 6	9522234-101	98747	1 2 3 4 5 6 7 WORKSTATION ASSY	REF		XB
1	4DX2-66	05358	(See Figure 8-2 for NHA) . COMPUTER SYSTEM, Digital (VID 9522333-001)	1		XB

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SECTION III NUMERICAL INDEX

PART NUMBER	FIGURE & INDEX NO.	PART NUMBER	FIGURE & INDEX NO.	PART NUMBER	FIGURE & INDEX NO.
4DX2-66	8-1	9522304-101	8-4	M39012/17-0101	8-
9522229-101	8-2	9522350-101	8-18	MODEL 501	8-6
9522233-101	8-1	9522353-102	8-17	MS24308/4-7	8-
9522233-101	8-3	9522431-001	8-	MS3368-1-9B	8-
9522234-101	8-2	9522431-001	8-	MS3368-1-9B	8-
9522234-101	8-6	9522445-101	8-1	P-TER2	8-4
9522279-101	8-3	A9005-950	8-1	SW250A	8-3
9522279-101	8-5	A9005-V54	8-1	TTW2.5F	8-
9522290-101	8-7	BC00103	8-	TTW2.5F	8-
9522296-101	8-11	BC635VME	8-2	TTW2.5F	8-
9522296-102	8-12	D-48604-S3	8-	TTW2.5F	8-
9522296-103	8-13	EBN25C-0025-MM	8-	TTW2.5F	8-
9522296-104	8-14	EDN12H	8-	TTW2.5F	8-
9522297-101	8-15	EYN600-0006-MM	8-	U125D1S25A1	8-21
9522297-102	8-16	EYN600-0020-MM	8-	U125D1S25A1	8-21
9522298-101	8-8	GPS-C030	8-	UBCB0140H25YJ	8-20
9522300-101	8-9	GPSTATION	8-5	UDC83020C25RT03	8-19
9522300-102	8-10	LQ-2550	8-4	VCOM-54	8-2
9522304-101	8-2	M39012/12-0101	8-		

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SECTION IV REFERENCE DESIGNATION INDEX

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